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ABSTRACT

This executive summary discusses our current understanding of the difficulties that children with reading/learning disabilities encounter as they start down the road to reading and summarizes research on early identification and intervention. The focus is on children in kindergarten through second grade. Findings from the analysis indicate: (1) the less efficient word reading of students with reading disabilities (RD) overloads working memory and undermines reading comprehension; (2) early identification of children most likely to encounter reading problems may constitute the first step in reducing incidence and severity of reading disabilities; (3) individual differences in prereaders' phonological awareness are among the best predictors of later reading success; (4) targeted phonemic awareness instruction with prereading children leads to significant gains in phonological awareness and in word-level reading skills; (5) when both phonetic awareness and decoding instruction are incorporated into a reading program, participants outperform students who received either alone; (6) more explicit approaches to teaching phonics lead to more positive decoding outcomes; (7) wide reading is essential for developing fluency, but students must become expert decoders before they can read widely; and (8) the level of reading accuracy necessary for a student to benefit from direct instruction ranges from 90 to 95 percent. (CR)

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EARLY IDENTIFICATION AND INTERVENTION FOR YOUNG CHILDREN WITH READING/LEARNING DISABILITIES

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EXECUTIVE SUMMARY

Introduction

Students with reading/learning disabilities face enormous challenges learning to read. Many never reach a level of reading proficiency that allows them to function in school. Therefore, the early identification and prevention of reading difficulties is important. This paper reports our current understanding of the difficulties that children with reading/learning disabilities encounter as they start down the road to reading and summarizes research on early identification and intervention. The focus is children in kindergarten through second grade, although research on older children is included when relevant.

Findings

Skilled Reading and Reading Disability

Comprehension is the immediate goal of reading. Successful reading comprehension requires the ability to read words, the ability to comprehend language, and the ability to access background knowledge. If students lack any one of these abilities, reading comprehension suffers. Although skilled readers can read single words fast and accurately, students with reading disabilities have inefficient word-level reading skills. Both word recognition and comprehension processes consume finite cognitive processing resources. As more processing resources are consumed for word identification, fewer resources are available for

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comprehension. The less efficient word reading of students with reading disabilities (RD) overloads working memory and undermines reading comprehension. Jenkins et al. (2000) found that in one minute of reading, skilled comprehenders read three times more words than did students with reading/learning disabilities (R/LD) and that the accuracy levels of students with R/LD were lower as well. In addition, students encounter "idea units" as they read. The faster they read, the more idea units they encounter—26 idea units a minute by the skilled readers versus 9 idea units a minute by the students with R/LD.

Research on skilled reading has disclosed the key components that go into making a skilled reader—phonological awareness, graphophonemic knowledge (letter-sound correspondence), decoding or alphabetic reading skill, automatic word recognition, fluency, and language comprehension. It has also revealed the nature of the relationships among these components. Sight word reading appears necessary for maximizing reading fluency and comprehension, decoding skill appears necessary for developing a large storehouse of sight words, and a knowledge of spelling-sound rules plus phonemic awareness appears necessary for alphabetic reading skill. The components are like steps on a ladder: Reaching the higher steps depends on climbing up the lower steps. Research has shown that students with reading disabilities are challenged in most or all of these areas: their reading is not as fluent as that of skilled readers; their orthographic reading skill is substantially below that of skilled readers; their decoding skills are especially weak; they are slow to develop phonological awareness; and their graphophonemic knowledge is less secure than that of skilled readers.

Early Identification of Students at Risk for Reading/Learning Disabilities

Early identification of children most likely to encounter reading problems may constitute the first step in reducing the incidence or severity of reading disabilities. Because school district personnel tend not to identify these children until the middle elementary grades, their reading

difficulties grow stronger roots and possibly become more intractable. For the most effective intervention, schools must find ways to identify these children much earlier than usually occurs.

Research on early identification originates from studies of potential causes of reading difficulties. These studies measure a range of children's preliteracy skills in kindergarten or first grade and then calculate the strength of the correlations between these skills and reading ability. Virtually all studies in which letter knowledge was measured in preschool, kindergarten, or early first grade documented its significant contribution to reading. However, findings on the unique additional variance in reading that vocabulary, short-term memory for language-related information, and efficient retrieval of verbal labels contribute have been inconsistent. Findings from studies of the combination of phonological awareness and letter knowledge have converged to indicate that these two combined account for 40 to 60 percent of the variance in reading skills.

Because sensitivity to the phonemic elements of spoken words is necessary for reading acquisition, researchers have examined various ways to assess children's phonemic sensitivity as a means to identify reading disabilities early. Yet, despite a strong correlation between children's phonological language skills and later reading acquisition, predicting exactly which children will develop a reading disability (RD) has proved problematic. Errors of both underprediction and overprediction have made accurate early identification of students with reading disabilities difficult. Underprediction is particularly troublesome because the children who most need early, intense, and targeted instruction are missed. Overprediction is troublesome because it consumes limited educational resources and provides a skewed validation of interventions. Although measures administered in first grade were more predictive than those given in kindergarten, they still missed 35 percent of the children who were poor readers one year later. Because a reasonably accurate prediction of reading disability (RD) is essential for evaluating the outcomes

of early intervention, researchers are attempting through a variety of efforts to increase the precision of their predictions by fine-tuning their assessment instruments and scoring rubrics – making them more sensitive by increasing the complexity of their measures – and by measuring additional constructs to raise the accuracy of the predictions.

Some researchers suggest screening students later than kindergarten to reduce the overidentification that results from kindergarten screening. Badian (1998), however, suggests that many children predicted to fail by her kindergarten measures in fact succeeded because of the instructional approach in first grade. That is, more children would have experienced reading failure, thus confirming the earlier predictions, if they had received a less structured reading program. Another alternative is to incorporate some of the features of early intervention (e.g., stronger emphasis on letter knowledge, phonological blending, and segmenting and on activities to promote the alphabetic principle) into general kindergarten routines so that children are less likely to score poorly on kindergarten screenings because of a lack of exposure.

Early Intervention for Students At Risk for Reading/Learning Disabilities

Early intervention researchers have concentrated their efforts on teaching alphabetic reading skills and their prerequisites, specifically phonological awareness and graphophonemic knowledge, to address the phonological weaknesses that are thought to cause word-level reading problems.

Teaching phonological awareness

Individual differences in prereaders' phonological awareness are among the best predictors of later success in learning to read. The strong relationship between phonological awareness and reading achievement remains even after children have received several years of reading instruction, which suggests a reciprocal relationship between the two skills. However, it is the early predictive value of phonological awareness along with its status as a prerequisite for

gaining insight into the alphabetic principle that has attracted the interest of prevention-oriented researchers.

Working inside and outside classrooms, teachers and researchers have used a variety of activities to teach phoneme awareness. A comprehensive listing of resources for assessing and instructing phonological awareness can be found in Torgesen and Mathes (2000). We examine some of the major questions pertaining to phonemic awareness instruction, along with a selection of the highest quality studies addressing these questions.

Do children benefit from phonemic awareness instruction in preschool and kindergarten? Targeted phonemic awareness instruction with prereading children (preschool and kindergarten) leads to significant gains in phonological awareness and in word-level reading skills. Phonemic awareness instruction has also proven beneficial when delivered by kindergarten teachers rather than research staff. Compared with control groups that did not receive such instruction, kindergartners in two studies performed significantly higher on measures of phoneme segmentation, spelling, and reading phonetically regular words and nonwords.

Does explicit phonemic awareness instruction add to the effects of phonics instruction for beginning readers? Whereas many typically developing students easily acquire phonemic insight, graphophonemic knowledge, and the ability to apply these skills to decode words, students with reading/learning disabilities encounter difficulties with these skills right from the start. This result has led some prevention researchers to conclude that merely incorporating phonemic awareness training in kindergarten is insufficient to overcome the challenges faced by students at risk for reading/learning disabilities. Kindergarten studies showed that when both phonemic awareness and decoding instruction were incorporated into a

reading program, the participants outperformed subjects who received either phonemic awareness or decoding instruction.

For students at risk for reading/learning disabilities, does phonological awareness instruction in kindergarten result in better phonological awareness and reading performance? Large numbers of low-achieving students (i.e., those most at risk for reading/learning disabilities) showed no gains in reading, even with the strongest treatments, and they should not be forgotten. Few researchers report the percent of children who, despite training, fail to acquire segmental language and decoding skills (i.e., nonresponders). Those researchers who do report this statistic find that as many as 30 percent of low-achieving kindergarten students do not show increased phonological awareness and 50 percent show no increase in reading performance after intensive interventions.

Does the type of reading instruction that students receive affect their need for explicit teaching of phonological awareness? Teaching students phonological awareness in kindergarten may be less important if they receive explicit and systematic instruction in phonics. But if students are left to figure out the code on their own (e.g., in a whole-language classroom), explicit phonological awareness may be critical.

How much phonological awareness is needed? Isolating the first sound in words appears to be insufficient for reading words through a decoding process. Further, if the ability to segment words into component morphemes advances no further than first-sound identification, this level may encourage the "use the first sound and guess" strategy for word identification – a strategy that is highly error-prone – that persists well into the elementary years for many children with RD. Minimum scores of 25 to 35 segments a minute in kindergarten were established as

indicators of children who would pass the Oregon State reading assessment at the end of third grade.

Teaching Alphabetic Reading Skill (Decoding)

Because students with LD have poorly developed alphabetic reading skill, and because this skill serves as a platform for acquiring orthographic reading proficiency, instructional researchers have sought effective ways to help students master decoding. Research has focused on three important questions—the relative effectiveness of more- and less-explicit instruction in establishing decoding skill, the relative value of an instructional focus on phonemes or rime units, and the effect of a focus on decoding results on increasing word-level reading skills.

Do beginning readers develop better decoding skills from more- versus less-explicit phonics instruction? When researchers have compared more- and less-explicit approaches to teaching phonics on decoding outcomes, they consistently report an advantage for more-explicit approaches (National Reading Panel Report, 2000). In three studies of varied approaches to teaching reading, groups that made the largest gains in decoding received decontextualized instruction in phonemic awareness and grapheme-phoneme relationships and were shown how to use graphophonemic information to read words. At the end of second grade, students who received a combination of auditory discrimination in depth with phonological awareness plus synthetic phonics instruction, and who spent 80 percent of their lesson time on word-level activities, significantly outperformed students who received an embedded phonics program with 43 percent of lesson time spent on word-level tasks, participated in a regular classroom support program, or were part of a no-treatment control. Two other studies of explicit versus embedded phonics had similar results.

Do explicit phonics treatments result in stronger word-identification skills for beginning readers? Although most explicit phonics treatments that obtain significant effects on

decoding also realize effects on word identification, results on word-identification measures are often smaller than those for decoding. Findings on the value of explicit decoding instruction for word identification divide according to students' stages of reading development.

Should decoding instruction emphasize phonemes or phonograms (word families)? In principle, each approach has its advantages. Focusing on phonemic units forces learners to attend to every letter—an important skill in reading. Focusing on phonograms regularizes vowel pronunciations. The answer to this question may depend on the child's reading level. A study of beginning at-risk readers found faster word learning in classrooms teaching phoneme-level decoding, but studies with older students (7 to 12) with severe reading disabilities found no advantage for either when used separately. However, in combination they produced superior performance to either approach used individually.

How can schools organize assessment and instruction to prevent or ameliorate reading/learning disabilities? Most early intervention research on reading/learning disabilities has focused on comparing the relative effectiveness of specific instructional approaches. Results of these studies remind us how much students vary in their responsiveness to instruction. Even with explicit and intense decoding instruction, most studies find that between 15 and 30 percent of students still performed significantly below average in decoding and word identification. If these students are to master alphabetic reading skills, they will require longer, more intense, or different treatments than they received.

Many important questions about the teaching of decoding remain unanswered or partially answered:

- Is it important to confine beginning reading practice to decodable text?

- What level of decoding skill is necessary for fast, accurate word identification and comprehension?
- How should we teach those children who do not reach adequate levels of decoding and word reading skill despite receiving our strongest treatments?

Research is sorely needed to identify specialized intervention approaches for students who do not respond to enhanced classroom instruction.

Promoting Orthographic Reading Skill (Fluency)

Because fluent reading is an important aspect of reading ability, a number of important questions about ways to facilitate its development in students with RD must be answered. Relative to their age peers, students with RD have far fewer words stored in memory.

What level of decoding is necessary before wide reading will boost fluency? Wide reading is essential for developing fluency, but students must become expert decoders before they can read widely. Nevertheless, we lack information about the level of decoding proficiency for wide reading to have its intended effect on fluency.

How does text difficulty affect the development of fluency? The level of reading accuracy necessary for a student to benefit from direct instruction ranges from 90 to 95 percent.

How should fluency instruction be organized? Studies suggest that repeated reading and continuous (non-repeated) reading produce gains in fluency. However, very few studies comparing repeated and continuous reading have been performed with struggling readers. We need to know more.

How can we encourage students with RD to increase their volume of reading? Information is needed about how to make reading practice easier and more enjoyable for students who struggle with reading, possibly by providing students with reading material that matches their interest or has the appeal of the Harry Potter series.

Does word study add to the effects of text reading practice? We still must determine whether extensive text practice by itself is sufficient to improve fluency, especially for students who do not learn words easily.

Conclusion

In sum, our understanding of reading disability derives primarily from an amalgamation of stage and verbal efficiency theories that link phonological processes to alphabetic reading skill to orthographic reading skill to language and reading comprehension. This theoretical framework guides much of the research on early identification and early intervention for students with reading/learning disabilities. Although we have learned much about the early identification and treatment of young children with reading/learning disabilities, we still have far to go.

The assessment and instructional practices derived from research have led to better outcomes for students with reading/learning disabilities because we have increased our accuracy in identifying children who subsequently exhibit reading problems. We know that early training of phonological awareness facilitates decoding and that explicit decoding instruction produces better orthographic reading skill. Nevertheless, questions linger about the long-term benefits of early phonological training, explicit decoding instruction, and fluency training. We must also think about the sizable number of children who are resistant to early intervention.

Successful prevention and treatment of reading/learning disabilities is the goal. Achieving that goal will take all our best ideas. Remaining open to different theoretical perspectives is both sensible and necessary.